



# SC2002 USB-PD DFP Controller with Multiple Fast Charge Protocols Integrated

## 1 Description

The SC2002 is a highly integrated PD DFP controller. It complies with the latest USB Type-C and PD 3.0 standards and supports the most popular high voltage fast charge protocols with up to 2x DPDM interfaces. The IC targets for notebooks, power banks and other mobile equipment applications.

The SC2002 supports wide operation voltage range with 30V maximum rating, and without the need of an external LDO. It minimizes external components by integrating USB PD baseband PHY, Type-C detection, voltage and current sense, 10-bit DAC for VBUS regulation, 10-bit ADC, shunt regulator, VBUS discharging path, the NMOS gate driver, I2C interface and protection circuits, so to allow easy system design and low BOM cost. Its embedded micro-controller and 32-KB MTP provide highly flexible and cost effective solution to many applications.

The SC2002 supports various protection mechanisms, including over voltage protection, under voltage protection, over current protection, short circuit protection, over temperature protection, DP/DM pin over voltage protection, and CC pin over voltage protection, so to effectively ensure the stable and reliable operation of the system.

The SC2002 is available in 32-pin QFN packages.

## 2 Features

- **USB Type-C**
  - Support Type-C DFP protocols
  - Configurable resistors R<sub>P</sub>
- **USB Power Delivery**
  - Support DFP USB PD 3.0
  - Hardware BMC transmitter and receiver
  - Full feature physical layer
  - Hardware CRC
  - Hardware reset
  - Integrate PD 3.0 protocol engine
- **Up to 2x DPDM Fast Charging Interface**
  - 1x hardware controlled DPDM Interface
  - 1x firmware controlled DPDM interface
  - Support Apple charging, BC1.2, DCP, HVDCP, FC, AFC, FCP, and other proprietary charging protocols
- **Power**
  - Wide operation range: 2.7V to 24.5V (30V tolerant)
- **MCU Subsystem**
  - Integrated 5V and 1.8V LDOs
  - Integrated CPU
  - 32-KB MTP and 2-KB Ram
  - Support I2C interface and multiple I/Os
  - CC program function
- **Analog Block**
  - 10-bit DAC for voltage regulation
  - Up to 5-channel 10-bit ADC to monitor the voltage / current / external signals
  - Integrated current sense amplifier
  - Integrated NMOS gate driver for isolation MOS
  - Integrated shunt regulator
  - Integrated VBUS discharging paths at both sides of isolation MOS
- **Protections**
  - On chip OVP, OCP, SCP, UVP and OTP
  - VBUS to CC / DPDM short protection
- **Package**
  - 32-pin QFN

## 3 Applications

- Power Bank
- Notebook, Tablet
- Other fast charge instruments

## 4 Device Information

Part Number	Package	BODY SIZE
SC2002QDER	QFN-32	4mm x 4mm x 0.75mm